

REMARKS

The Amendments

Claim 1 is amended to clarify that both q and r are not 0. Further dependent claims and a new set of claims depending on new independent claim 9 are also added. The new independent claim is a narrower recitation within claim 1. Support for the amendment to claim 1 is found in the specification at page 9, line 23, and in the Examples of polymer A to C. Support for the new claims is found throughout the specification; see, for example, page 6, line 13, to page 7, line 18; page 9, lines 20-25; page 11, lines 4-20; page 12, lines 1-8; page 12, lines 19-21; the original claims; and the exemplary polymers used as shown in Table 1.

By the amendment to claim 1, the polymer of formula (1) now also requires an acid labile group, further distinguishing the prior art. Otherwise, the amendments do not narrow the scope of the claims and/or were not made for reasons related to patentability. The amendments should not be interpreted as an acquiescence to any objection or rejection made in this application.

To the extent that the amendments avoid the prior art or for other reasons related to patentability, competitors are warned that the amendments are not intended to and do not limit the scope of equivalents which may be asserted on subject matter outside the literal scope of any patented claims but not anticipated or rendered obvious by the prior art or otherwise unpatentable to applicants. Applicants reserve the right to file one or more continuing and/or divisional applications directed to any subject matter disclosed in the application which has been canceled by any of the above amendments.

The Rejection under 35 U.S.C. §103

The rejections of:

- claims 1 and 2 under 35 U.S.C. §103, as being obvious over Takechi (U.S. Patent No. 5,443,690) in view of Allen (U.S. Patent No. 5,962,184) and Aldrich's Catalog ("Aldrich") or over Takechi in view of Kobayashi (U.S. Patent No. 6,342,542) and Aldrich;
- claim 3 over either of the above further in view of Houlihan (U.S. Patent No. 5,843,624); and
- claim 4 over either of above further in view of Okazaki (U.S. Patent No. 6,284,427);

are respectfully traversed. Because the issues pertinent to each of the six grounds of rejection are so inter-related – as will be apparent from the discussion below – they are being addressed together.

Takechi discloses pattern forming compositions containing one of the two types of copolymers described at col. 1, line 54, to col. 2, line 8, and more specifically discussed at cols. 2-6. The first described copolymer (col. 1, lines 54-62) contains a unit having a polycyclic aromatic ring, a condensed aromatic ring or an aromatic ring with an alicyclic, branched alkyl or halogen substituent and a unit having a photosensitive group further described in cols. 2-3. The second described copolymer (col. 2, line 63, to col. 3, line 8) contains units of a vinylphenol, an acrylic or methacrylic acid ester with a particularly stated ester group or a vinylbenzoic acid and units of an acrylic or methacrylic acid ester with an alicyclic group-containing ester group.

Takechi does not disclose the use of these copolymers together. All disclosure in Takechi relates

to the use of only one base polymer in its compositions. The Office Action points out the copolymer recited at col. 9, lines 35-45. It would appear that this copolymer contains a vinylphenol unit, a methacrylic acid ester with alicyclic ester group unit and a methacrylic acid ester with tert-butyl ester group unit. However, such a copolymer does not fit within the more general description of either one of the two copolymers described by Takechi at cols. 1-2. The first copolymers generally described by Takechi do not include a vinylphenol unit and the second copolymers generally described by Takechi do not include a methacrylic acid ester with tert-alkyl ester group unit. Although Takechi's specific disclosure at col. 9 must be taken at face value, it is urged that this disclosure must be limited to that very narrow embodiment since, otherwise, Takechi's disclosure does not even generically include such a copolymer.

As noted in the Office Action, Takechi fails to disclose compositions which contain a combination of copolymers. Particularly, Takechi fails to disclose a composition having an additional copolymer which has vinylphenol units wherein at least some -OH groups are replaced by -O-acid labile moiety groups. Compare applicants' formula (1) noting that q and r are not both 0.

It is respectfully submitted that neither Takechi nor any of the other relied upon references teaches or suggests modifying Takechi or otherwise providing a pattern-forming composition having two distinct copolymers. Particularly, neither Takechi nor any of the other relied upon references teaches or suggests modifying Takechi or otherwise providing a pattern-forming composition having two distinct copolymers, such as of applicants' formulae (1) and (2).

Allen teaches the additional use of polyhydroxystyrene together with its hydroxystyrene and (meth)acrylate copolymers. However, polyhydroxystyrene is not a copolymer and certainly

does not meet the recitations of applicants' formula (1) or (2). Kobayashi provides a similar teaching to Allen regarding the use of polyhydroxystyrene and is, therefore, distinguished on the same basis. Aldrich, Houlihan and Okazaki all were cited for teachings unrelated to the nature of the base polymer or copolymers and, thus, provide no suggestion for modifying the Takechi copolymers or adding additional copolymers.

No combination of the prior art teachings would suggest to one of ordinary skill in the art a pattern-forming composition having two different copolymers both having acid labile group units, such as those of applicants' formula (1) and (2).

Regarding new claims 9-16, these claims are patentable over the prior art for the reasons given above but also for the following additional reasons. Takechi, nor the other references, provide any suggestion of the copolymers as more specifically defined by these claims. As discussed above, Takechi's disclosure of a copolymer at col. 9, lines 35-45, has to be limited by the fact that this copolymer does not fall within the general disclosure of Takechi. This copolymer does not fall within the scope of applicants' formula (2) wherein R^{11} is as defined in these claims. Thus, this embodiment of Takechi meets neither of applicants' formula (1) or (2).


Regarding new claims 6, 7, 14 and 15, these claims are patentable over the prior art for the reasons given above but also for the following additional reasons. Takechi, nor the other references, provide any suggestion of the copolymers as more specifically defined by these claims. For example, no reference even remotely suggested any polymer where $s \neq 0$ as required by the equations of claims 6 and 14. Nor does any reference suggest any particular ratio for the combined q and r variables since no reference discloses a polymer having both such units defined by such variables.

For all of the above reasons, it is respectfully submitted that the prior art of record, in any combination, fails to render the instant claims obvious to one of ordinary skill in the art. Thus, each of the several rejections under 35 U.S.C. §103 should be withdrawn.

It is submitted that the claims are in condition for allowance. However, the Examiner is kindly invited to contact the undersigned to discuss any unresolved matters.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



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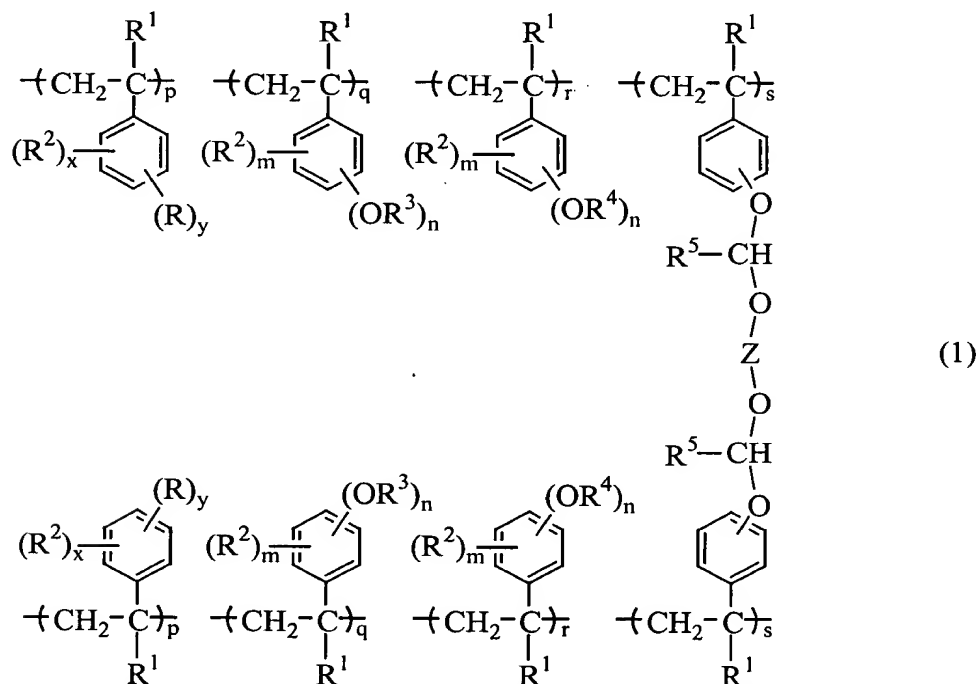
Attorney Docket No.: KOJIM-383

Date: October 7, 2002
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**VERSION WITH MARKINGS TO SHOW CHANGES MADE
IN THE CLAIMS**

Amend claim 1 as shown:

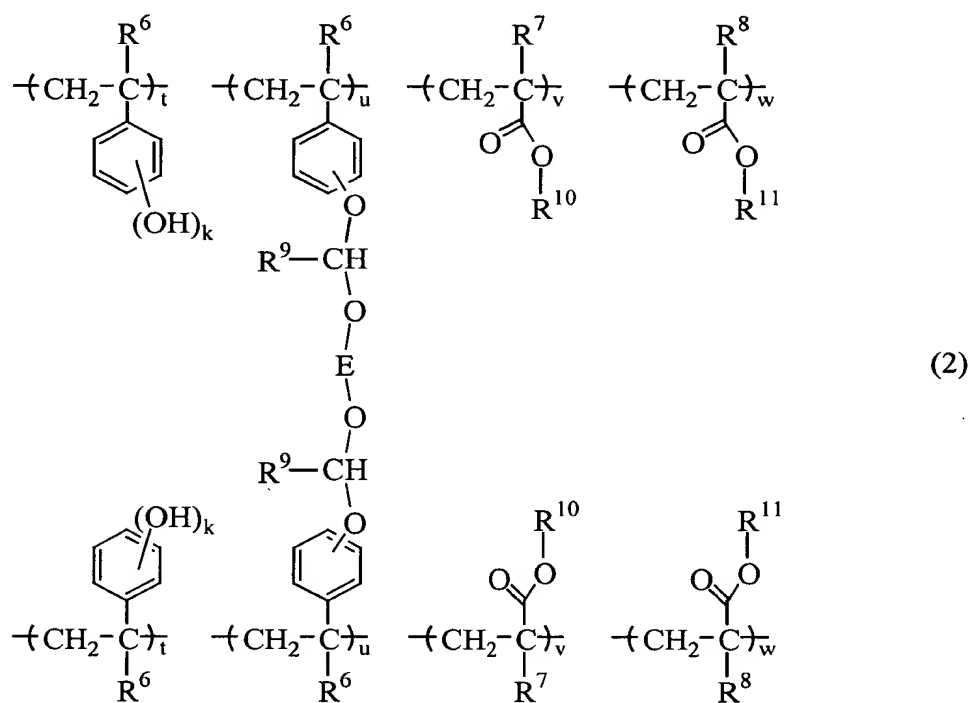
1. **(Amended)** A chemical amplification type resist composition comprising a polymeric mixture of a polymer comprising recurring units of the general formula (1) and having a weight average molecular weight of 1,000 to 500,000 and a polymer comprising recurring units of the



general formula (2) and having a weight average molecular weight of 1,000 to 500,000,

wherein R is a hydroxyl group or a OR³ group, R¹ is hydrogen or methyl, R² is a straight, branched or cyclic alkyl group of 1 to 8 carbon atoms, R³ and R⁴ each are an acid labile group, R⁵ is methyl or ethyl, Z is a straight, branched or cyclic alkylene group of 1 to 10 carbon atoms, x is

0 or a positive integer, y is a positive integer, satisfying $x+y \leq 5$, m is 0 or a positive integer, n is a positive integer, satisfying $m+n \leq 5$, p, q, r and s each are 0 or a positive number, satisfying $p+q+r+s = 1$, provided that q and r are not both 0.



wherein R^6 , R^7 and R^8 each are hydrogen or methyl, R^9 is methyl or ethyl, E is a straight, branched or cyclic alkylene group of 1 to 10 carbon atoms, R^{10} is a straight, branched or cyclic alkyl group of 1 to 20 carbon atoms, which may contain an oxygen or sulfur atom, R^{11} is a tertiary alkyl group of 1 to 20 carbon atoms, k is 0 or a positive integer of up to 5, t and w each are a positive number, u and v each are 0 or a positive number, either one of u and v is not equal to 0, satisfying $t+u+v+w = 1$.